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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/740,751 | 12/19/2000 | Tongbi Jiang | 23804-P002C2 | 8773 |
| 7590 02/28/2006 | | | EXAMINER | |
| TERRIL G. LEWIS WONG CABELLO, LLP 20333 SH 249, SUITE 600 HOUSTON, TX 77070 | | | CHANG, RICK KILTAE | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 3729 | |

DATE MAILED: 02/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 09/740,751 | Applicant(s) JIANG ET AL. | |
| | Examiner Rick K. Chang | Art Unit 3729 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-96 is/are pending in the application.
- 4a) Of the above claim(s) that are not listed in item 6 below is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-25, 27-30 and 47-52, 54-55 is/are rejected.
- 7) ☒ Claim(s) 26 and 53 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 18-19, 30 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burgess (US 4,642,160) in view of Liebowitz (US 4,513,055).

Burgess discloses first 16 and second 18 materials, Fig. 7 shows 28, 12 is a pad, 16 is a positive CTE, 16 is thicker than 18, except for a negative CTE for second material.

Liebowitz discloses a negative CTE for second material (col. 3, lines 30-31).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Burgess by providing a negative CTE for second material, as taught by Liebowitz, for the purpose of preventing unwanted expansion and contraction when the electronic component is mounted on a PCB.

3. Claims 20-21 and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burgess (US 4,642,160)/Liebowitz (US 4,513,055) as applied to claims 18 and 47 above, and further in view of Sanjana et al (US 4,590,539).

Burgess/Liebowitz fail to disclose silicon oxide and polyimide.

Sanjana discloses polyimide (col. 1, lines 53-54).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Burgess/Liebowitz by providing polyimide, as taught by Sanjana, for the purpose of manufacturing a PCB without E-glass fabrics.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to provide silicon oxide because Applicant has not disclosed that incorporating silicon oxide provides a novel device, is used for a particular purpose, or solves a stated problem. Therefore, it would have been an obvious matter of design choice to modify Burgess/Liebowitz to obtain the invention as specified in claims 20-21.

4. Claims 22-25 and 50-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burgess (US 4,642,160)/Liebowitz (US 4,513,055) as applied to claims 18 and 47 above, and further in view of Anderson et al (US 6,195,193).

Burgess/Liebowitz fail to disclose single-crystal, amorphous or polymer bound Zirconium tungstate.

Anderson discloses Zirconium tungstate (col. 15, line 10).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Burgess/Liebowitz by providing Zirconium tungstate, as taught by Anderson, for the purpose preventing unwanted expansion and contraction when the electronic component is mounted on a PCB.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to provide single-crystal, amorphous or polymer bound Zirconium tungstate because Applicant has not disclosed that incorporating single-crystal, amorphous or polymer bound Zirconium tungstate provides a novel device, is used for a

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particular purpose, or solves a stated problem. Therefore, it would have been an obvious matter of design choice to modify Burgess/Liebowitz to obtain the invention as specified in claims 22-25.

5. Claims 27-28 and 54-55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Burgess (US 4,642,160)/Liebowitz (US 4,513,055) as applied to claims 18 and 47 above, and further in view of Wilson (US 5,966,803).

Burgess/Liebowitz fail to disclose that the substrate is ceramic and a package of an IC.

Wilson discloses that the substrate is ceramic and a package of an IC (col. 1, line 57).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Burgess/Liebowitz by providing ceramic and a package of an IC, as taught by Wilson, for the purpose of forming an electronic device using cheap materials.

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Burgess (US 4,642,160)/Liebowitz (US 4,513,055) as applied to claim 18 above, and further in view of Official Notice.

Burgess/Liebowitz fail to disclose forming the first material using a spin-on process followed by a photo-define and –etch process.

Official Notice is taken that it is well known in the art to form a polymer material using a spin-on process followed by a photo-define and –etch process to apply uncured material on a substrate and to form vias therein.

Allowable Subject Matter

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7. Claims 26 and 53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments filed 12/27/05 have been fully considered but they are not persuasive.

Col. 6, ll 1-10 discloses that the ratio of the positive and negative CTE can be varied as desired.

Fig. 3 shows the copper layer above the positive and/or negative CTE material to control unwanted thermal expansion and contraction.

Interviews After Final

9. Applicant note that an interview after a final rejection must be submitted briefly in writing the intended purpose and content of the interview (the agenda of the interview must be in writing). Upon review of the agenda, the Examiner may grant the interview if the examiner is convinced that disposal or clarification for appeal may be accomplished with only nominal further consideration. **Interviews merely to restate arguments of record or to discuss new limitations will be denied.** See MPEP 714.13 and 713.09.

Conclusion

10. Please provide reference numerals (either in parentheses next to the claimed limitation or in a table format with one column listing the claimed limitation and another column listing corresponding reference numerals in the remark section of the response to the Office Action) to all the claimed limitations as well as support in the disclosure for

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better clarity (optional). Applicants are duly reminded that a full and proper response to this Office Action that includes any amendment to the claims and specification of the application as originally filed requires that the applicant point out the support for any amendment made to the disclosure, including the claims. See 37 CFR 1.111 and MPEP 2163.06.

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rick K. Chang whose telephone number is (571) 272-4564. The examiner can normally be reached on 5:30 AM to 1:30 PM, Monday through Thursday.

The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and (571) 273-8300 for After Final communications.

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RICHARD CHANG
PRIMARY EXAMINER

RC

February 22, 2006